

CONTINUOUS AND DISCRETE SCALES IN ADJECTIVES

Marcia Haag

Dept. of Anthropology, University of Oklahoma

1 Introduction

In making distinctions in lexical category, syntactic and morphological evidence is ultimately unreliable because members of different lexical categories may serve in most major functional categories, and morphology may be polyfunctional or absent (Haag, 1996). For instance, adjectives and nouns may serve as clausal predicates, and the English suffix *-s* is well-known for having three distinct grammatical functions: plural marker and possessive marker in nouns, and third-person singular agreement marker in present tense verbs. English *-s* does not therefore identify a lexical category but is itself interpretable only when the category of its base is known. Research has thus turned to the identification of lexical categories through properties that are identifiable at the level of the lexeme (Beard, 1995, Haag, 1996).

The typical adjective is predicative, attributive, continuously gradable, and able to show comparison. In many languages, gradability has morphological exponence, as in the English comparative affix *-er* to mark positive comparison:

- (1) a green coat (attributive)
my coat is green (predicative)
my coat is very green (continuously gradable)
my coat is greener than yours (comparative morphology)

Even though the typical adjective can be readily identified through the expression of some value of gradation (intensive, comparative, superlative), there are a number of words that are problematic in that they are functionally adjectives — they are modifiers of nouns and semantically predicated of nouns — but do not meet the criterion for adjectives as it has been set out. There are three problem cases (using English examples):

- (a) words that are semantically not gradable, but meet gradation tests for typical adjectives. Examples are *pregnant*, *perfect*, *complete*. 'Belinda looked very pregnant', in order to form a more perfect union', 'please make this more complete.'
- (b) words that are attributive and predicative, and bear adjectival morphology, but do not meet gradation tests. Examples are *vital*, *total*. Sally's (*more) vital infection, a (*very) total loss.
- (c) words that modify nouns but have no adjectival morphology and do not meet gradation tests. Examples are *next*, *four*. The more (*more) next street, (*very) four birds chirped.

Abstracting from the idea of gradation, the more general term SCALE is posited as the categorial property of adjectives. To have lexemic scale means that the notional content of a lexeme is treated as being present or absent to some degree. If adjectives are treated as having scale rather than gradation, then we can evaluate adjectives in terms of more and less informative scales, particularly CONTINUOUS and DISCRETE scales. It will be seen that the difficult cases such as *viral* and *four* fail gradation tests because they cannot be graded continuously.

Lexemic scale is different from notional expressions of quantity, which may occur in any lexical category. The claim here is that adjectival scale is differentiable as a property of the category, that scales may be either continuous or discrete, and that lexemic scale can be distinguished from other linguistic treatments of notional quantity. To this end it is shown that discrete scales may have morphological exponence in Choctaw, and that notional quantity is not lexemic scale, such that lexemic scale is independent of semantic gradability.

2 The continuous scale

The typical adjective has a *continuous scale*: distinctions are made along a continuous grade from the point 'not-A' with no upper bound. Using *green* as an example, this lexeme can be continuously graded from a point 'not green' through any number of iterations of greener without bound. Intensives are values on the continuous grade as is the superlative:

- (2) The glow grew very green, extremely green, and then greener and greener until it was absolutely the greenest of all; then it grew greener still.

It is important to note that the scale of the lexeme *green* is not tied to real-world measurement of any physical phenomenon. This accounts for the ostensible mismatch between the semantic denotations of *pregnant* and *perfect* and their ability to be graded: these lexemes have continuous scale, even though their meanings should render them not gradable. By definition *perfect*, for example, means 'flawless, lacking nothing', and prescriptivists caution against the vacuity and illogic of such locutions as 'very perfect' or 'more perfect', which also mean 'flawless, lacking nothing'. The difference between 'the perfect wife' and 'the most perfect wife' is perhaps one of emphasis, since both wives are flawless given their description by *perfect*. But linguistically there is nothing problematic about *most perfect*. Note that the all-or-nothing concepts *pregnant*, *perfect* and *complete* are adjectives in good standing because these lexemes have the continuous scale: not because of the inherent gradability of the semantic notion. In contrast, the lexeme *total*, a synonym of *complete*, does not have continuous scale and cannot take degree modification with *very* or specification for comparative and superlative.

For the term scale to have meaning, it is first necessary to establish the category to which the scale applies. Since the claim is that the category adjective itself is

scalar, then the category with scale is the lexeme (Matthews, 1991). This implies that scalar effects do not occur outside the lexeme (in other lexemes in the phrase) or in subparts of the lexeme (morphemes or notional content). An example of 'scale at the level of the lexeme' is in order. If the lexeme *green* has scale, then gradations in *green* must take place in the category *green* as a lexeme and not in a category larger or smaller than the lexeme, such as *yellow and green*. Change in the value of scale is demonstrable both morphologically and with degree-specifying modifiers in this particular lexeme.

- (3) *green*
 greener
 greenest
 very green

Constructions that show comparison in a category larger than the lexeme are not valid examples of lexemic scale.

- (4) a This banana is more green than yellow
 b *This banana is greener than yellower
 c Frankenstein is more man than monster
 d Lulu is more coquettish than not

The examples above violate the condition that lexemic scale be confined to the category of the lexeme. Rather, they set up a construction 'it is more the case X (\X is some proposition)' than 'it is the case that X (\X is some proposition)'.¹

- (5) a It is more the case that this banana is green than it is the case that it is yellow
 b Frankenstein is more like a man than he is like a monster
 c It is more the case that Lulu is coquettish than it is the case that she is not coquettish

Note particularly in (4b) that comparative morphology *-er* cannot be used in the 'more X than Y comparison'. This is evidence that the scalar category is not the lexeme but a phrase.

Words that commonly modify the lexeme *green* indicate a value of (continuous) scale. These modifiers often have no semantic content indicating degree, and only trigger values of scale when used with adjectives. Among such degree-specifying words are *real(ly)*, *that*, *pretty*, and *rather*.

- (6) *real(ly) green* ~ *very green*
 not that green ~ *not very green*
 pretty green ~ *very green*
 rather green ~ *green to a middling degree*

Modification of adjectives triggers a value of scale because the lexeme itself is scalar, this is the property that is linguistically salient and pertinent in adjectives. This permits interpretation of intensity in adjectives modified by words that do not have semantic quantity themselves.¹

- (7) You were damned (very) lucky
 He was filthy (very) rich
 We were awfully (very) happy
 This dessert is sinfully (very) delicious
 We saw precious (very) few good antiques

Compare the entirely different effects of these modifying words with the noun *chair*:

- (8) (a) teal chair
 that chair
 (a) pretty chair
 *rather chair
 (a) damned chair
 (a) filthy chair
 (an) awful chair
 (a) precious chair

3 Choctaw morphological evidence for the discrete scale

I have described the continuous scale as a mathematical continuum. Looking to the math model again, particularly to statistical definitions of scale, we may note that there are other kinds of scales, particularly discrete scales.

The least informative scale is the nominal level scale, in which distinctions in a category have only contrast points, and these contrast points may be as few as 'present' and 'absent'. What is equally important to the definition, and to its linguistic application, is that this scale, like all scales, must be exhaustive (an adjective must have some value of scale) (Thomas, 1986).²

¹There are some manner adverbials, Adv-ly A' that preserve the relationship 'A in Adv way' such as 'Fred was charmingly aggressive, Billy was cutely incompetent' that can mean simply 'Fred was aggressive in a charming way, Billy was incompetent in a cute way'. It is not necessary that all constructions with adjectives exploit the property scale.

²Data measured on the nominal level is treated with nonparametric methods. Quoting from Hunsberger and Billingsley (1981: 446):

These do not require that the underlying populations be normal — or indeed that they have any single mathematical form — and some even apply to nonnumerical data. In place of parameters such as means and variances and their estimators, these methods use ranks and other measures of relative magnitude.

To detect the discrete scale, we must set out some means for distinguishing scale in the lexeme, since this property is likely to have no morphological exponence. If a lexeme has the property scale, changes brought about either through morphological means or through interpretive means must occur in the lexeme, and the meaning change must be a value of the property scale. In the continuous scale, these values are 'intensive, comparative, superlative'. If the scale is discrete, the meaning change will be some value of 'presence' or 'absence' of the quality named in the lexeme. These values may be expressed as 'all the way A', 'falling short of a point A', 'no more and no less than A', and the like.

Let us examine the Choctaw data first, since Choctaw has two morphological operations that yield values of the discrete scale: this scale is thus overt in Choctaw.

Choctaw adjectives may take two morphological operations that trigger the discrete scale. These are termed the 'N-grade', consisting of the lengthening and nasalization of a penultimate vowel, and the 'YY grade', consisting of the gemination of the onset consonant of the penultimate syllable, or substitution of a geminate /yy/ in that onset position, along with a characteristic stress pattern (Ulrich 1992). In adjectives, both operations indicate an intensive value of the continuous scale, and the precisely A' or 'all the way A' value of the discrete scale. The YY-grade is higher valued in intensity than the N-grade: for example *really sick* versus *extremely sick*.

In typical adjectives, those with continuous scale such as *chito* 'big', the N-grade and YY-grade operations produce values of intensity:

- (9) *chito* 'big'
chito 'very big'
chiyyinto 'extremely big'

Choctaw numerals may also take the N-grade operation, and this operation yields not 'very Numeral' but 'just Numeral', that is 'no more and no less than Numeral':

- (10) *oshta* 'four'
ôshta 'just four, exactly four, precisely four'

Choctaw numerals are not continuously gradable lexemically, but they have lexemic scale. As seen in (9), the change indicated by the N-grade morphological operation has its effect at the level of the lexeme, and marks a change in a value of the discrete scale. This change is comparable to that in (8) where the N-grade affects the lexeme, and the change is a value of the continuous scale.

Other Choctaw words that are often used as quantifiers may take the YY-grade morphological operation. The output of the derived form may be glossed as something like 'absolutely A':

- (11) *alla pota* 'every child'
alla poyyota 'every single child'
alla moma 'all children'
alla moyyoma 'absolutely all children'

These Choctaw quantifiers show a meaning change in the lexeme, and that change is a value of the discrete scale, 'all the way A'

However, one reservation that must be attended to is the possibility that the Choctaw numerals and quantifiers take morphological scale indicators because they in fact have a typical continuous scale, and all effects are due to English glossing. Then Choctaw 'very every', very four' would be an idiosyncratic fact about Choctaw. However, there is a third morphological operation that can apply to Choctaw adjectives, the H-grade, the infixing of /h/ in coda position of the penultimate syllable. In adjectives such as *chito* 'big' this operation produces the comparative value of the continuous scale

- (12) *chito* 'big'
chihto 'bigger'

The group represented by *oshta* 'four' and *moma* 'all' cannot take the H-grade operation. The comparative is a value of the continuous scale. To the extent that H-grade is exclusively associated with the comparative in adjectives, its failure to appear on one group is evidence that these adjectives have less informative scales than the typical continuous scale.

So in Choctaw, typical adjectives may take three morphological operations: two of which mark intensity (N-grade and YY-grade) and the third marks the comparative (H-grade). One group of predicative words, numerals, takes only the N-grade operation, and another group including several quantifiers takes only the YY-grade. This is evidence that these groups do not fully participate in the range of adjectival values available to typical adjectives: those with continuous scale. But it is also evidence that there is a meaning contrast at the level of the lexeme (words marked with the operations do not have the same meaning as those without), and that meaning contrast is a value of some kind of scale: speakers never offer glosses that have to do with any other property. The scale thus satisfies the condition that it be exhaustive. A less-informative scale, the discrete scale, may be morphologically overt in Choctaw.

4 English interpretive evidence for the discrete scale

English modifiers that are morphologically adjectives but fail typical gradation tests may be seen to be adjectives with discrete rather than continuous scale. Lacking a morphological operation such as Choctaw N-grade or YY-grade, evidence outside the lexeme must be marshalled to show that scale is present in lexemes such as *vital* and *total*. Other words such as numerals also show scalar effects.

While there is no English modifying word that will satisfactorily differentiate discrete from continuous scale in all lexemes, different effects are apparent with the use of a number of degree-specifying words: *just*, *quite/not quite*, and *altogether*.

Among its effects, *just* will trigger the reading of 'very' in continuously graded adjectives and 'no more and no less than' in numerals. *Just* cannot occur as a modifier of nouns, only of noun phrases, when it means 'only'

- (13) a Bill just arrived (recent perfective aspect)
 b The movie is just dreadful (intensive, continuous scale)
 c The box holds just three melons (precisely A, discrete scale)
- (14) He's just [a boy]_{NP} (merely, only)
 *He's a just boy

Note that in (13b), the lexeme *dreadful* shows scalar effects at the level of the lexeme 'really dreadful, very dreadful, intensively dreadful'. In (14) the lexeme *boy* does not have scale in either *just a boy* or **just boy*.

Another diagnostic set is *quite* and *not quite*, which have different effects on adjectives depending on the kind of scale the adjective has. *Quite* preferably means 'all the way A', but has a second and popular reading 'very' (This definition is from the American Heritage Dictionary 1978 New College Edition). *Not quite* is used to mean 'falling short of point A' but does not mean 'not very'. Furthermore, it usually does not mean 'it is not the case that N is quite A'; this reading is possible but requires different phrasal stress. So, *quite* may trigger an intensive value in an adjective with continuous scale while *not quite* triggers a discrete reading.

- (15) a That novel is quite long (continuous)
 b *That novel is not quite long (discrete)
 c There were not quite five pages left (discrete)
 d *There were quite five pages left (continuous)

(The last example is acceptable when *quite* has the meaning 'all the way A' though it sounds stilted to my ear.)

In the examples above, the typical adjective *long* is seen to have continuous scale. *Not quite* triggers the discrete scale, which accounts for the infelicitousness of 'not quite long', which does not mean 'not very long'. In contrast 'not quite six' is perfectly compatible with the discrete reading.

In some lexemes with a discrete scale, such as *five*, modifiers such as *just* and *not quite* may trigger values along the discrete scale that may be differentiated in the meaning of the lexeme. Other lexemes, such as *vital* are less likely to be used with these modifiers.

Vital may show the 'all the way A' and 'falling short of a point A' readings with *quite/not quite*.

- (16) This infection looks quite vital to me
 But there's something not quite vital about that infection

It may also show the 'present' value with the modifier *altogether* in its meaning 'all the way A'

- (17) This other infection is altogether viral

Similar effects are seen with *total*

- (18) The not-quite total failure of my business set me back
The destruction of lemonade stand was altogether total

Quite, not quite may have scope over NP but may not modify nouns, and do not trigger a scalar value, rather, *quite* with NP means 'impressively, notably' and *not quite* means 'lacking some attribute'

- (19) Jasper is quite [a man] ~ Jasper is an impressive example of a man
Jasper is not quite a man ~ Jasper lacks something that would grant status as a man

Quite does not trigger scale in verbs It may be used in some dialects as an emphatic such as 'truly'

- (20) Fred has quite trounced his opponent ~ Fred has — certainly, truly, definitely — trounced his opponent

(*Do*) *not quite* may be glossed with 'not truly, not definitely' with the additional sense of 'do imperfectly, miss succeeding in'

- (21) I don't quite understand

Again, *understand* in this last example is not scalar the lexeme does not treat its notional content as some quality that may be 'present' or 'absent' (nor as some quality that may be continuously graded)

I have not used *not* to make distinctions between values of 'present' and 'absent' Even though the negator *not* will differentiate 'present' and 'absent', one must also distinguish 'absent' (having scale) from it is not the case that (any proposition) Tests with *not* are therefore inconvenient

- (22) Lulu's infection was [viral] (present)
Lulu's infection was [not viral] (absent)
Lulu's infection was not [anything to bother with] (negated proposition)

A further illustration of the idea of lexemic scale may be seen in words that have no scale, such as *certain* in its sense of 'particular'

- (23) I like a certain restaurant
* I like a not quite certain restaurant
* I like an altogether certain restaurant
* I like a not certain restaurant

Certain does not have scale because it has a single value, and so it does not have the minimal two contrasts necessary to be scalar. There is no linguistic contrast at the level of the lexeme indicating 'the quality named in the lexeme *certain* is present or absent: *certain*, not *certain*'. *Certain* in its specifying sense does not qualify as an adjective since it has neither a continuous nor a discrete scale.

5 Derivational morphology and notional content expressing 'not'

There are other considerations with respect to 'presence' and 'absence' having to do with derivational negating affixes. Because scale occurs at the level of the lexeme, derivational operations having negating force are not by themselves evidence of lexemic scale. It is important that the discrete lexemic scale, with values 'present' and 'absent' be at the level of the lexeme, and not part of the notional content of the word. Derivations expressing 'not' violate the requirement that adjectival scale be present at the level of the lexeme: contrast occurs in a smaller category than the lexeme.

For example, the prefix *in-* may negate an adjective as part of its derivational morphology, without changing the category of the lexeme, and also without indicating the discrete scale. Derivatives with the *in-* prefix generally have continuous scale.

- (24) adequate
 inadequate
 very inadequate

The lexeme *inadequate* does not have a scale along the lines of 'a quality *inadequate* is present or absent, perhaps including the values 'all the way A' falling short of A'''. Rather, the quality named in the lexeme *inadequate* is present or absent to a continuously greater or lesser degree. The prefix *in-* does not affect the scale of the adjective to which it affixes: the scale remains continuous.

The word-level prefix *non-* similarly indicates 'not N' in nouns, but does not change the category of the lexeme, and marks no lexemic scale at all.

- (25) bird
 non-bird
 three non-birds

6 Conversion to adjectives by acquisition of lexemic scale

We may convert *non-bird* to an adjective by having it acquire lexemic scale.

- (26) three non-bird animals
 The beasts looked non-bird
 *The beasts looked non-birds

Note that when the lexeme *non-bird* acquires lexemic scale it no longer has nominal features (specifically number in this example). The presence of the prefix *non-* does not determine lexical category or mark lexemic scale. The fact that *non-bird* is notionally 'not bird' does not mean that the lexeme has the value 'absent' on the lexemic discrete scale.

If scale is the essential adjectival property, a lexeme should not be able to have lexemic scale and be a member of another lexical category at the same time. Choctaw depends on this for interpretation of its morphological grade operations. Besides marking values of scale in adjectives, the morphological grades mark values of aspect in verbs. For example, the N-grade marks stative aspect in verbs and intensive in adjectives. A Choctaw lexeme cannot have a value of scale and a value of aspect marked with a single grade operation. Here, the N-grade operation produces the stative aspect in the verb *ish:* 'get' but the intensive value of scale in the adjective *chito* 'big'.

- (27) *ish:* 'get'
 ish: 'have'
 chito 'big'
 chito 'very big * being big' * being very big

Similarly, if we convert an English noun to an adjective, it should not be able to show both scalar effects and nominal features.

- (28) Two Daffy Ducks came to his birthday party
 They didn't look very Daffy Duck to me
 *They didn't look very Daffy Ducks to me

In (28) the nominal property number cannot appear if *Daffy Duck* is an adjective, that is if it has the property scale.

- (29) Todd and Lucille are fool enough to eat fire
 *Todd and Lucille are fools enough to eat fire

In (29) *enough* fails when *fool* has number, signaled by the plural marker, rather than scale.

To conclude, the lexical category adjective may retain its primary property, scale, if scales are allowed to be very informative (continuous) or less informative (discrete). We have morphological evidence for discrete scale marking in Choctaw and interpretive evidence in English from the different uses and effects of several degree words. The most crucial idea is that in adjectives the category to which scale pertains is precisely the lexeme, neither larger, at the phrasal level, nor smaller, at the notional level.

References

- Beard, R. 1995. *Lexeme-morpheme base morphology: a general theory of inflection and word formation*. Albany: State University of New York Press.
- Haag, M. 1996. *Lexical categories in Choctaw and universal grammar*. PhD thesis, State University of New York at Stony Brook.
- Huntsberger, D., and P. Billingsley. 1981. *Elements of statistical inference*, fifth edition. Boston: Allyn and Bacon.
- Matthews, P. 1991. *Morphology*. Cambridge: Cambridge University Press.
- Thomas, D. H. 1986. *Refiguring anthropology: first principles of probability and statistics*. Prospect Heights, IL: Waveland Press, Inc.
- Ulrich, C. 1992. A unified account of Choctaw intensives. In *Toronto working papers in linguistics: proceedings of the 1992 Canadian linguistics association annual conference*, Toronto: Canadian Linguistics Association.